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OBA YOSHIMI**(54) FLAKY SILICA PARTICLE, CURABLE COMPOSITION, HARDENED BODY FORMED THEREFROM AND MANUFACTURING METHOD THEREOF**

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a flaky silica particle having self-film forming property and capable of forming a rigid silica coating film even at the normal temperature and a curable composition using the same.

SOLUTION: A hardened body is formed by preparing a leaf like silica secondary particles, which are formed by orienting the slice primary particles of the flaky silica so that the surfaces are in parallel each other and several pieces are laminated and exist independently each other, and using the curable composition containing the silica secondary particles.



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**CLAIMS**

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[Claim(s)]

[Claim 1] The scale-like silica particle to which the primary flake particle of a scale-like silica has mutually the shape of particle of the laminated structure characterized by becoming substantial and existing independently mutually from the secondary foliaceous silica particle formed by carrying out orientation in [ between fields ] parallel, and two or more sheets lapping.

[Claim 2] The scale-like silica particle according to claim 1 which is that to which a pore diameter has a sharp peak in 2-6nm in the pore distribution measurement by the nitrogen adsorption-process (BET) method.

[Claim 3] The scale-like silica particle according to claim 1 or 2 which is the silica to which the main peak in X-ray diffraction analysis of a silica particle corresponds to silica-X and/or silica-Y.

[Claim 4] The hardenability constituent characterized by the bird clapper from the scale-like silica particle which has the shape of particle of a laminated structure according to claim 1 to 3, and an volatile liquid.

[Claim 5] The hardenability constituent according to claim 4 which contains further the low volatile matter which does not volatilize substantially at the temperature to which the aforementioned volatile liquid volatilizes.

[Claim 6] The content of a scale-like silica is SiO<sub>2</sub>. Hardenability constituent according to claim 4 or 5 which is one to 80 mass % in conversion.

[Claim 7] The hardenability constituent according to claim 5 which is the precursor matter in which the aforementioned low volatile matter forms an organic polymeric material by the organic polymeric material or polymerization reaction.

[Claim 8] The hardenability constituent according to claim 5 whose aforementioned low volatile matter is matter which has adsorption and a desorption function.

[Claim 9] The hardenability constituent according to claim 5 whose aforementioned low volatile matter is matter which has a catalyst function.

[Claim 10] The hardenability constituent according to claim 5 whose aforementioned low volatile matter is matter which has an optical function.

[Claim 11] The hardenability constituent according to claim 5 whose aforementioned low volatile matter is metallic compounds.

[Claim 12] The hardening object which the primary flake particle of a scale-like silica carries out orientation mutually in [ between fields ] parallel, and is characterized by having carried out the laminating of the secondary foliaceous silica particle formed by two or more sheets lapping in [ secondary / further / particles ] parallel, and constituting it.

[Claim 13] hardening -- the hardening object according to claim 12 which contains the aforementioned low volatile matter further inside of the body

[Claim 14] hardening -- the hardening object containing the precursor matter which forms an organic polymeric material in the inside of the body by the organic polymeric material or polymerization reaction according to claim 13

[Claim 15] hardening -- the hardening object containing the matter which has adsorption and a desorption function inside of the body according to claim 13

[Claim 16] hardening -- the hardening object containing the matter which has a catalyst function inside of the body according to claim 13

[Claim 17] hardening -- the hardening object containing the matter which has an optical function inside of the body according to claim 13

[Claim 18] hardening -- the hardening object containing metallic compounds other than an amorphous silicon dioxide which is different from a scale-like silica inside of the body, and/or a silicon dioxide according to claim 13

[Claim 19] The hardening object according to claim 15 whose matter which has adsorption and a desorption function is silica gel.

[Claim 20] The hardening object according to claim 16 whose matter which has a catalyst function is titanium oxide.

[Claim 21] The hardening object according to claim 17 which are one sort or two sorts or more of particles chosen from the group which the matter which has an optical function becomes from titanium oxide, a zinc oxide, a cerium oxide, an iron oxide, and a zirconium oxide.

[Claim 22] The hardening object according to claim 18 whose metallic compounds other than the amorphous silicon dioxide from which a scale-like silica differs, and/or a silicon dioxide are colloidal particles.

[Claim 23] The hardening object according to claim 12 to 22 whose hardening object is a paint film.

[Claim 24] The hardening object according to claim 12 to 23 which is the silica to which the main peak in X-ray diffraction

analysis of a silica particle corresponds to SHIRIKA X and/or SHIRIKA Y.

[Claim 25] The hardening object according to claim 24 whose ratios of the peak height whose 2theta is 26.0 degrees to the peak height whose 2theta is 4.9 degrees in the X diffraction view measured about the hardening body surface of silica-X are 0.0-0.5.

[Claim 26] The manufacture method of the scale-like silica particle for hardenability constituents characterized by providing the following. (1) The secondary foliaceous silica particle which hydrothermal processing was carried out under existence of an alkali-metal salt, and the primary flake particle of a thin-film-integrated-circuit silica carried out orientation of either a silica hydrogel, active silica or a water silicic acid mutually in [ between fields ] parallel, and lapped two or more sheets. The gap in which the secondary particle concerned is formed by overlapping irregularly in three dimensions.

[Claim 27] SiO<sub>2</sub> The manufacture method of a scale-like silica particle according to claim 26 that concentration uses the silica hydrogel of 15 - 75 mass %.

[Claim 28] The manufacture method of a scale-like silica particle according to claim 26 or 27 that the hydrothermal processing temperature concerned is [ the total silica / alkali mole ratio in 150-220 degrees C and processing liquid (SiO<sub>2</sub> / Me<sub>2</sub> O (Me shows alkali metal)) ] 4-15 mols/mol while carrying out hydrothermal processing of the silica hydrogel.

[Claim 29] The manufacture method of a scale-like silica particle according to claim 26 to 28 of performing a crack and decentralization of a 3rd silica floc particle using wet-grinding equipment.

[Claim 30] The manufacture method of a scale-like silica particle according to claim 29 of performing a crack and decentralization of a 3rd silica floc particle using the high-speed machine stirring formula wet-grinding equipment using a medium bead.

[Claim 31] The manufacture method of a scale-like silica particle according to claim 26 to 28 that the combination of a jet mill and a dry classifier performs continuously a crack and decentralization of 3rd silica floc particle dryness powder.

[Claim 32] Separation material for thin-layer chromatography characterized by forming the paint film containing the silica gel particle concerned and a scale-like silica particle on a base, using a scale-like silica particle according to claim 1 to 3 as a binder of a silica gel particle.

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